

Fluorescent photopolymer films for holographic recording

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The photo-reactive difunctional acrylate monomer was synthesized and investigated for holographic recording. The mixture of ethylene glycol ether acrylate, mono-functional acrylate monomer, and difunctional methacrylate monomer (DT) with binder polymer (polysulfone), photo initiator and fluorescent compound was coated onto slide glasses and cured for 12hours. Pyrene and rubrene, commercially available, were used as fluorescent probes. The content of fluorescent compound was changed to examine the effect of the chromophore on diffraction efficiency and holographic grating formation. Holographic recording was performed on the photopolymer film by the combination of reference and probe beam. The diffraction efficiency in real-time reached ~80 % within 30 s and increased with higher content of fluorescent compound. After holographic recording, the emission intensity of the recorded area was higher than that of the non-recorded. Fluorescent grating pattern was formed from the photopolymer film and observed by fluorescence microscope.